

EP30TC Master Bond Polymer System

Two component, room temperature curing, thermally conductive epoxy with ultra fine particle filler

Key Features

- ✓ Highly thermally conductive filler
- ✓ Superior electrical insulation properties
- ✓ Applicable in very thin bond lines
- ✓ NASA low outgassing

Product Description

Master Bond EP30TC is a multifaceted epoxy for use in thermal management applications. It is a specialty formulation that can be used for bonding, coating, sealing and encapsulation. When used as an adhesive, the thermally conductive filler has very fine particle sizes; subsequently, it can be applied in sections as thin as 5-15 microns. Since it has a lower viscosity and excellent flow properties, it is a good fit for coating and potting. EP30TC has a forgiving ten to one mix ratio by weight. It will cure in 2-3 days at room temperature or in 2-3 hours at 150-200°F. To optimize properties, the recommended cure schedule is overnight at room temperature followed by 2-3 hours at 150-200°F.

EP30TC bonds well to a variety of substrates including metals, composites, ceramics, glass and many plastics. As mentioned previously, it has a specialty type filler that allows it to be applied in very thin sections. When this property is combined with its inherent high thermal conductivity, the net result is significantly lower thermal

resistance, $7-10 \times 10^{-6} \text{ K}\cdot\text{m}^2/\text{W}$; much less than standard thermally conductive epoxies. Some other desirable features of EP30TC are its outstanding electrical insulation, very low shrinkage upon curing, excellent dimensional stability and low CTE. Prior to mixing, EP30TC should be refrigerated but not frozen. The service temperature range is -100°F to +300°F. The color of Part A is gray and Part B is clear. This sophisticated system can be used in applications in aerospace, electronic, optical and OEM where the property profile described above is desirable.

Product Advantages

- Lower viscosity, good flow properties
- High thermal conductivity and electrical insulation
- Can be applied in very thin sections
- Exceptional compressive strength
- Outstanding abrasion resistance
- Meets NASA low outgassing specifications

Typical Properties

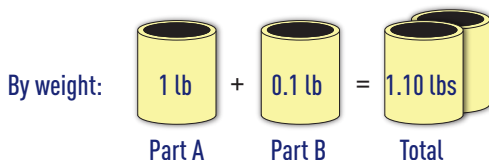
Tensile lap shear strength, aluminum to aluminum, 75°F	600-800 psi
Tensile strength, 75°F	5,000-6,000 psi
Tensile modulus, 75°F	600,000-700,000 psi
Compressive strength, 75°F	24,000-26,000 psi
Hardness, 75°F	85-95 Shore D
Abrasion resistance, CS-17 wheel, 1,000 cycles	54.1 mg
Volume resistivity, 75°F	$>10^{14} \text{ ohm}\cdot\text{cm}$
Thermal conductivity, 75°F	18-20 BTU \cdot in/(ft ² \cdot hr \cdot °F) [2.60-2.88 W/(m \cdot K)]
Coefficient of thermal expansion, 75°F	$20-22 \times 10^{-6} \text{ in/in/}^\circ\text{C}$
Dielectric strength, 75°F (1/8 inch thick test specimen)	>400 volts/mil
Dielectric constant, 75°F, 60 Hz	4.7
Service temperature range	-100°F to +300°F [-73°C to +149°C]

Mixing and Curing

Mixing ratio, Parts A to B	10:1 by weight
Viscosity of Part A, 75°F	14,000-28,000 cps
Viscosity of Part B, 75°F	280-500 cps
Working life after mixing, 75°F; 100 gram batch	90-120 minutes
Cure schedule options	
75°F	48-72 hours
200°F	2-3 hours
Optimum cure schedule	Overnight at 75°F plus 2-3 hours at 150-200°F
Shelf life at 40-50°F, in original unopened containers	6 months

Preparation of Adhesive

Master Bond EP30TC is prepared for use by thoroughly mixing Part A with Part B in a ten to one mix ratio by weight.



Mixing should be done slowly to avoid entrapping air. Color coding of EP30TC makes mixing easy as Part A is colored gray and Part B is clear. Simply mix in a ten to one mix ratio by weight. The working life of a mixed 100 gram batch is about 90-120 minutes. It can be lengthened by using shallower mixing vessels or mixing smaller size batches. Please note refrigeration and not freezing is recommended for storage.

Preparation of Bonding Surfaces

All bonding surfaces should be carefully cleaned, degreased and dried to obtain maximum bond strength. When bonding to metal surfaces, chemical etching should be employed when the bonded joints are to exhibit optimal environmental durability. Non-porous surfaces should be roughened with sandpaper or emery paper for hard materials.

Adhesive Application

EP30TC can be conveniently applied with a spatula, knife, trowel, brush, paint roller, etc. As mentioned earlier, EP30TC is formulated so that it may be applied in very thin sections. Porous surfaces may require somewhat more adhesive to fill the voids than non-porous ones. Thicker glue lines do not increase the strength of a joint but do not necessarily give lower results as EP30TC does not contain any volatiles. The

parts to be bonded should then be pressed together with just enough pressure to maintain intimate contact during cure. In casting applications, it may be necessary to vacuum degas in order to remove the relatively few air bubbles that may have been formed when mixing.

Cure

EP30TC can be cured at room temperature or at elevated temperatures as desired. At room temperature, EP30TC cures within 48-72 hours. Faster cures can be realized at elevated temperatures, e.g. 2-3 hours at 200°F. Remove any excess adhesive promptly before it hardens with a spatula. Then wipe with a rag or solvent such as MEK, toluene or acetone. When bonding, it should be noted that the thinner the section of epoxy the slower the rate of cure.

Packaging

Product is available in:

- 1/2 Pint kits
- Pint kits
- Quart kits
- Gallon kits
- 5 Gallon kits



Specialty packaging is also available in premixed and frozen syringes.

Handling and Storage

All epoxy resins should be used with good ventilation and skin contact should be avoided. For safe handling details, please consult the product SDS. Optimum storage is refrigeration at 40-50°F in closed containers. Containers should be kept closed when not in use to avoid contamination. Cleanup of spills and equipment is readily achieved with aromatic or ketone solvents employing proper precautions of ventilation and flammability.

Certifications



Not to Be Used for Specification Purposes

The values contained herein are considered typical properties only and are not intended to be used as specification limits. For assistance in preparing specifications, please contact Master Bond technical support for further details.

Notice

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